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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/658,425	09/10/2003	Masatoshi Anma	242614US2	3184
22850	7590	10/29/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.			HU, SHOUXIANG	
1940 DUKE STREET			ART UNIT	
ALEXANDRIA, VA 22314			PAPER NUMBER	
			2811	

DATE MAILED: 10/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/658,425

Applicant(s)

ANMA ET AL.

Examiner

Shouxiang Hu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 3-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09/10/2003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Claims 3-6, 8 and 10-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on August 16, 2004.

In addition, claims 7 and 9 which are directed to a method are also withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention pursuant to 37 CFR 1.142(b), as being unreadable on in the elected invention of Group I that is directed to a device.

2. Applicant's election with Species I of Group I invention in the above reply is acknowledged. The traversal is on the ground(s) that the field of search for the various species is overlapping and includes a handful of sub-classes. This is not found persuasive as explained below.

The subject matters of either of the device claims and the method claims in the instant disclosure includes substantially multiple distinctive variations as identified in the species election requirement set forth in the previous office action. And, the field relevant to these subject matters is a very active one, which includes tens of thousands patent references for each of Class 257 (device) and Class 438 (method), along with many foreign references. As a result, search and consideration for each of the identified distinctive species for each of the distinctive Groups would impose substantially undue

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burden on the examiner. Nevertheless, it is reassured that, upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141.

The requirement is still deemed proper and is therefore made FINAL.

Accordingly, claims 1-14 are pending in this application; and claims 1 and 2 remain active in this Office action.

Claim Objections

3. Claims 1 and 2, as being supported by the elected species, are objected to because of the following informalities and/or defects:

Claim 1 recites the term of "a lower electrode" of the recited capacitor; but, as shown in the specification and drawings (especially Fig. 2), the recited "electric conductor" (14) is also a part of the lower electrode of the capacitor.

In addition, it is noted that the file 14 in the elected species of Figs. 2-8 is formed of ruthenium oxide, which is a conductor, not "an insulator". Accordingly, the recited term of "an insulator" in claim 1 is not fully supported by the elected species.

In claim 1, the term of "a material" should read as: --a chemical element--.

Appropriate correction is requested.

Claim Rejections - 35 USC § 102

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4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 1, as being best understood in view of the claim objections above, is rejected under 35 U.S.C. 102(e) as being anticipated by Han (US 2002/0011620).

Han disclose a semiconductor device including a capacitor (see the cover page figure), comprising: a lower electrode (28; Ta) which has an upper surface and a side surface and has an opening on the upper surface; an electric conductor (29, TaN) provided at least in the vicinity of an entry in the opening; a dielectric film (32a) of the capacitor facing the upper surface and the side surface of the lower electrode; and an upper electrode (34).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 2, as being best understood in view of the above claim objections, is rejected under 35 U.S.C. 103(a) as being unpatentable over Han in view of Liao et al. ("Liao"; US 2002/0022321).

The disclosure of Han is discussed as applied to claim 1 above.

Although Han does not expressly disclose that the capacitor structure can be further extended to the outer sidewalls of the lower electrode, one of ordinary skill in the art would readily recognize that such extension is desirable for increase the capacitance of the capacitor, as evidenced in Liao (see the lower electrode 630a in Fig. 10, the capacitor therein has an increased capacitance).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to make the device of Han with the effective capacitive area being extended from the inner sidewalls to the outer sidewalls of the lower electrode, per the teachings of Liao, so that a memory device with increased capacitance in the capacitor would be obtained. And, in such a collectively taught device, the electric conductor which exists in the inner sidewalls would be naturally extended to the outer sidewall of the lower electrode via the top of the lower the electrode.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References C and D are cited as being related to a capacitor structure.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

October 22, 2004



SHOUXIANG HU
PRIMARY EXAMINER